

Canadian Journal of PUBLIC HEALTH

UNIVERSITY
OF MICHIGAN

The National Journal of Preventive Medicine

APR 25 1952

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MARCH 1952

Number 3

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Fortieth Annual Meeting

CANADIAN PUBLIC HEALTH ASSOCIATION

Fort Garry Hotel, Winnipeg

June 16-18, 1952



PUBLISHED MONTHLY BY THE

CANADIAN PUBLIC HEALTH ASSOCIATION

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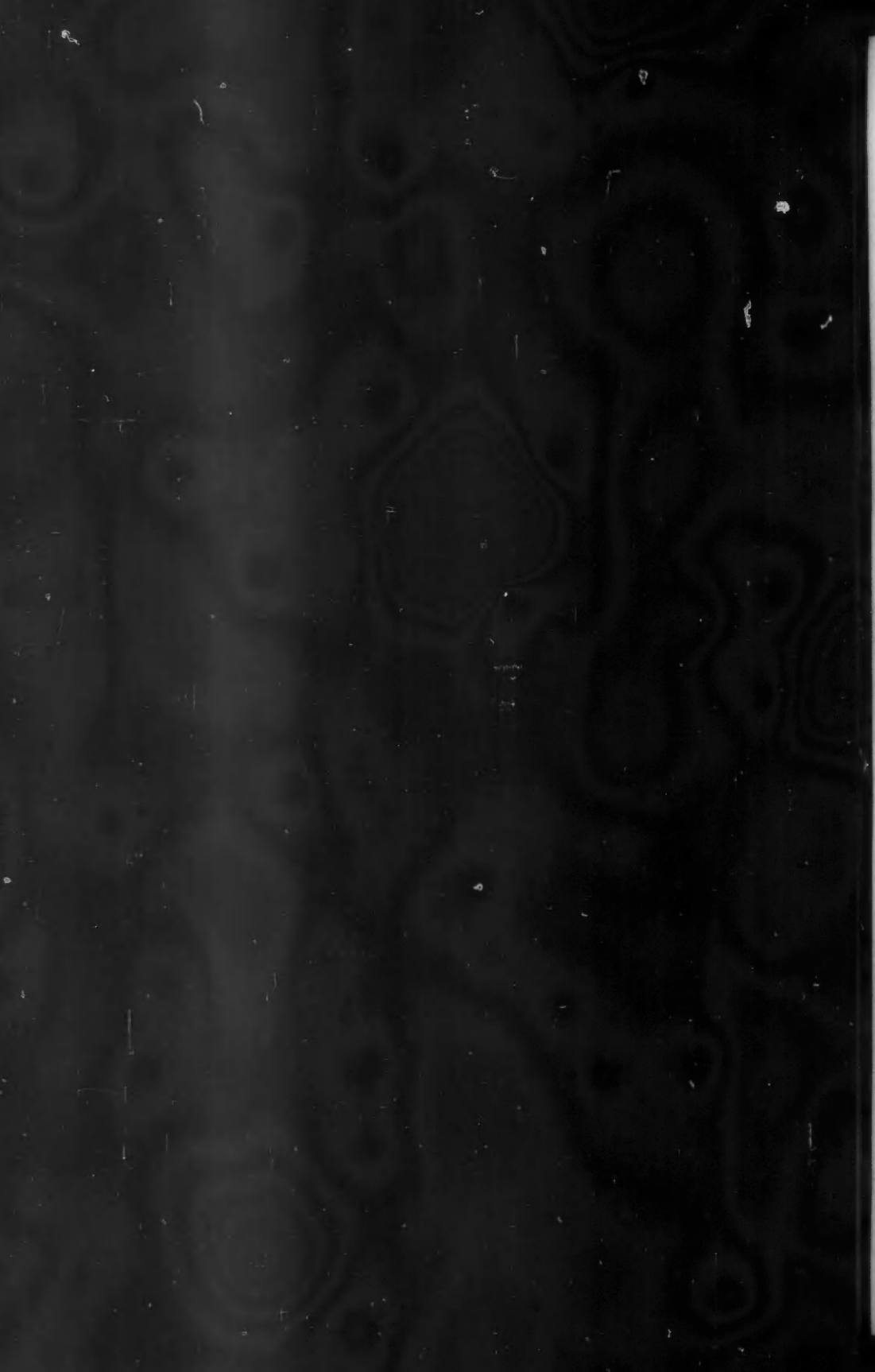
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Canadian Journal of PUBLIC HEALTH

VOLUME 43

TORONTO, MARCH 1952

NUMBER 3

The Role of the Public Health Nurse in Attack or Disaster

ANNE BROWN

*Country Nursing Officer, Huntingdonshire, England**

and

Chairman, Public Health Section, Royal College of Nursing

TEAMWORK in the whole civil defence program is of primary importance, and if Canada has plans for the evacuation of priority groups from vulnerable areas, every effort should be made to keep public health nurses in close contact with planning, so that they may be consulted on billeting problems and be prepared for such difficulties as will arise from incompatibility and emotional problems.

Early in World War II, many of our most experienced public health nurses—or health visitors, as we call them—were detached to take charge of first-aid posts. Had intensive bombing of London occurred immediately, these appointments would no doubt have been justified, but we felt that their specialist experience was much more needed among the children spread about the country. It is difficult to give a picture of the tension which existed during the war years. This accounted for most of the emotional difficulties among mothers in ante- and post-natal hostels, and for the problems which fell to be dealt with by billeting officers, though most people were willing to put up with many inconveniences as their contribution to the war effort. I thought our evacuation scheme marvellous in conception and planning. Where it failed, as it did on occasion, the reason for failure could always be attributed to incompatibility. Here is the first and fundamental need for teamwork. Health visitors could have given a great deal more help than was asked of them in advising on suitable houses for billeting children. Little attempt was made to link persons of similar background; the placing of a woman from a slum tenement in a neat middle-class house was doomed to failure. Children from slum houses often settled down in better-class houses, rather to

Read before the Public Health Nursing Section at the thirty-ninth annual meeting of the Canadian Public Health Association, held in the Mount Royal Hotel, Montreal, May 28–31, 1951, in conjunction with the annual meeting of La Société d'hygiène et de médecine préventive de la province de Québec.

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the detriment of their own family relationships. Had I to live through this again, I would try at an early stage to bring the health visitors into a discussion on classification of houses and persons on both sides, in an attempt to avoid misfits.

*The Preparation of the Civilian Population for Self-Help
and the Possible Role of the Public Health Nursing Supervisor*

We gave talks on simple home nursing and first aid to Women's Institutes and such other groups of women as could be gathered together. The influx of evacuees and increase of population in reception areas brought extra work, which meant that family self-help had to be developed. Nurses can give this instruction and can at the same time prepare persons for an alteration in their way of life and help them to develop stability socially and emotionally.

In view of the additional work to be undertaken by public health nurses, there had to be acceptance of responsibility and discrimination in putting first things first.

If I give you some idea of the extension of services in Hertfordshire during the war, you will see that this sense of responsibility and discrimination developed as we went on. I can give only a very sketchy outline, but experienced public health nurses will be able to fill in the gaps.

Apart from the setting up of maternity units, which were opened in September 1939, we developed services as we needed them: sick bays, buffer hostels, ante- and post-natal hostels, residential nurseries, scabies clinics, cleansing stations, and minor ailment clinics. If this movement of population was to happen again, I would hope to see all these ready for use, particularly the hostels, for there misfits can be fairly happy, at least happier than with a family where they are not wanted.

Administrative Responsibility

One thing is important, namely to settle administrative responsibility. I do not know Canadian local government administration. It may be less departmentalised than ours. For example, in this country responsibility for the care of children was divided among the departments of Health, Education, and Housing. Close co-operation and frequent meetings at senior officer level brought agreement on the division of duties. Housing was responsible for billeting in private houses; Education, for day-to-day administration, i.e., ordinary supplies for nurseries, residential schools, buffer hostels; Health, for sick bays, maternity homes, ante- and post-natal hostels.

Within the County Health Department the county medical officer was responsible for general policy and medical problems. Nursing administration, appointments, arrangements of work, supervision, nurse-training schemes, etc., were the responsibility of the county nursing superintendent. This division of work, free discussion and action, goodwill and trust of each other, made it possible for us to deal with an immense amount of work speedily and without friction.

Working on these lines, I found myself responsible, as county nursing officer, with the help of three assistants, for the supervision of midwives, district nurses, health visitors, and school nurses. Some 160 nurses covered the needs of a population of approximately 400,000.

The nurses were for the most part "generalized" workers, undertaking midwifery, health and school visiting, and general sick nursing duties in their areas. Most had small motor cars for official use and these were maintained throughout petrol rationing and the war. In the towns—i.e., St. Albans, Letchworth, Welwyn Garden City—we had a division into two sections, nurse-midwives undertaking general sick nursing and midwifery, and health visitors combining health and school visiting. The nurses attended approximately 3,200 home deliveries and 15,000 cases of general sick nursing per annum. Approximately 20,000 children between 0-5 years were visited at home by nurses and health visitors, and some 50,000 school children were given care by the nurses acting as school nurses.

Maternity beds for institutional deliveries, ante- and post-natal clinics, infant welfare centres, and certain clinics for school children were available in certain areas, and it was the responsibility of the County Council, through its Medical Department, to plan an extension of these services sufficient to meet the needs of a substantial increase in the population of the administrative county. The increase was to come from the transfer of certain "priority groups" of persons to be evacuated from dangerous areas to places of greater safety. The largest group was children of school age who were not accompanied by parents and for whom billets were found in private houses. The other groups were:

- | | |
|---|--|
| (a) Expectant and nursing mothers. | } Both these groups to be billeted in
private houses. |
| (b) Mothers with young children. | |
| (c) Children under the age of 5 years coming to residential nurseries. | |
| (d) Blind persons, the aged, and other special groups who were accommodated in Homes. | |

The greater part of Hertfordshire was scheduled as a "reception centre". For civil defence purposes, the country was divided into evacuation or danger areas; e.g. coastal districts, large towns and strategic areas liable to bombing, neutral areas not considered to suffer direct attack, and reception areas not considered to be vulnerable. In this plan, that part of Hertfordshire which joins the County of Middlesex and is in the London Metropolitan Police area only about ten to fifteen miles from the heart of London, was neutral, and not scheduled to receive children from London. The rest of the County was an official reception area.

In the neutral area most of the population "stayed put". First-aid posts were provided for civilians in the event of bombing, but no official evacuees were sent there, though large numbers of transferred workers who were sent in from other districts to various factories required accommodation in the area. Many brought wives and children with them and after a period of continual air attacks on London, workers in London whose homes had suffered bombing, and who had a friend or relative in the neutral area of Hertfordshire, flocked out to the comparative peace of this suburban countryside. A major annoyance to us all at that time was the noise from aircraft overhead and the anti-aircraft batteries. We came to appreciate a quiet night.

Arrangements for Reception of Evacuees

You will know something of the plan for the collection of children in London and other evacuation areas in this country. Parties met at an official reception centre with luggage labelled and with labels fastened to each child, generally on

a tape around the neck. The party was escorted by bus and train to the dispersal point in the reception area. All children were supposed to be free from infection, and clean in person and clothing. The receiving authority was notified of the number expected and the approximate time of arrival. After the first influx at the beginning of the war, when we had little experience of the varying degree of cleanliness among the children we were expected to take into our homes, a system of "health inspection" was introduced at the dispersal station. One of the school medical officers and a health visitor attended and carried out a very quick examination of heads, enquired into the possibility of bed wetting, and gathered such other information as the escorts, usually the school teachers, could give. This helped with the sorting out of problems. Dirty children and those with enuresis were directed to special hostels, and though we did not avoid all the problems arising from mistakes in billeting, we were spared some trouble, and health visitors knew something of the homes to which children were sent.

In the part of the County labelled "Reception" we had in 1941 some 60,000 persons officially billeted. Of these approximately 20,000 were school children. In addition there was an unknown number of persons who had made private arrangements. We estimated that the total number of these two groups, "officially evacuated" and "private persons", came to well over 100,000 persons. This in itself, without transferred workers and others, was an increase of 25% over the normal population. We also had transient evacuees such as expectant mothers who came into the country for a period of four weeks before the expected date of delivery. They were billeted either in private houses or in hostels. Numerous private schools and certain day nurseries and nursery schools became residential establishments in our County. I cannot remember the actual number of these, but I believe at one time it was about 20. You will easily understand the extension of services which was needed to deal with this influx and the anxiety with which we faced it, for not only were nurses and doctors called for service with the forces, but a good many were needed to staff the emergency hospitals and their increased number of beds.

Emergency Maternity Homes

Several London teaching hospitals detached part of their establishment to converted mansion houses in the country. Hertfordshire is rich in large country houses. Some which will interest Canadian nurses are Woolmer Park, the country home of the late Countess of Strathmore, mother of our present Queen; Home Farm Tring, once the property of the Rothschild family; Twyford House, the home of the late Bartle Frere, a contemporary and colleague of Cecil Rhodes. These beautiful houses made surprisingly good maternity homes, although by modern standards the layout left a good deal to be desired. There was a lack of facilities for sterilising, passages were long and stairs many, and creature comforts for the nursing staff minimal. Beds and equipment for these homes were supplied by the Ministry of Health. Staffing was done through the County Medical Department, and I had responsibility for recruitment of nursing staff. In most cases, a particular parent hospital in London agreed to provide sufficient trained staff to maintain a high standard of nursing care. Training schools for midwives wished to continue student training in these units, and were able to do so, cer-

tainly under difficulty but with success. Some of these hospitals may be known to you, particularly "The London", famous among medical schools, the City of London Maternity Hospital and the General Lying In Hospital, both well known as training centres for midwives. In addition, we had units from the London County Council Hospital. Altogether fourteen such maternity homes were established, providing approximately 400 beds for the use of women from evacuated areas. The County Medical Officer, Dr. Hyslop Thomson, who retired in August 1940 and was succeeded by Dr. J. J. Dunlop, was responsible for general policy in the administration of these homes, and had as obstetrical adviser Sir Eardley Holland. In two hospitals a resident medical officer was appointed; otherwise all units were staffed entirely by qualified midwives and students in training, with a general practitioner on call for emergencies. The maternal mortality rate was very low indeed, less than one per thousand. Some Hertfordshire residents were allowed admission to these homes on a strict priority basis, each application being carefully screened and a bed allocated according to need. Applications were classified in the following way: (1) in case of obstetric abnormality; (2) overcrowding at home or other unsuitable circumstances; and (3) lack of home help.

I hope you will not feel that Hertfordshire mothers suffered hardship at this time by being encouraged to stay at home. We believe in the safety of home deliveries and our statistics for maternal and infant mortality with domiciliary care, show very good results indeed. At least one lady of title, daughter of an earl, was delivered in one emergency maternity home because she had no help at home!

Billeting the mothers for four weeks of rest and waiting before admission to the maternity home became a problem, as it became necessary for private householders to give homes to their relations and friends. In order to meet this difficulty, ante-natal hostels were opened.

Ante-Natal Hostels

These again were the largish houses requisitioned for the purpose, furnished and maintained at the expense of the Ministry of Health, generally with about 20 to 30 places in each one. They were economically staffed, usually with a matron in charge, a cook, and part-time domestics. The expectant mothers helped with chores such as washing up, preparing vegetables, dusting, etc. In this type of home, the matron is the most important person. We found it wise to have someone who was an experienced midwife so that expert ante-natal supervision was continuous. Ante-natal supervision started in London, where mothers booked for hospital and attended ante-natal clinics. They brought their case histories with them, so that we had some knowledge of their obstetric condition when they arrived and could pick up the threads at once.

Mothers were often emotionally upset. The act of leaving home and husband, and often family, in London, produced a reaction which did not make it easy for them to settle into community life. However, our midwives are very clever in their handling of expectant mothers, and in a few days the party settled down to a regular routine of rests, country walks, knitting and sewing parties. A good deal of quiet, unobtrusive health teaching went on in discussion of food and cooking problems, provision of properly planned diets, making baby clothes, and

rules of health generally. Mothers waited in the ante-natal hostel until the first signs of labour, when they were transferred to the maternity home; there they remained for fourteen days. We tried to persuade mothers to spend some time in the country before being billeted or returning home, and therefore provided post-natal hostels.

Post-Natal Hostels

In this we were not very successful. Four weeks' rest before labour, and delivery in a normal, quiet atmosphere away from air-raid warnings and noise, which gave peaceful nights, proved to be an amazingly good tonic. After fourteen days in the maternity home, most mothers felt fit and well enough to deal with their domestic duties, and returned home immediately. Some who had not made a very quick recovery, perhaps through the presence of some physical disability—cardiac conditions, for example—and those with small babies, requiring close supervision, remained for a short time. In hostels such as these, in addition to the matron, who was usually a State Registered Nurse and State Certified Midwife, we tried to engage at least one nursery-college trained nurse, and every opportunity was taken to teach good infant care and something of child development. Lord and Lady Desborough lent their house, Panshanger, for this purpose; and though this began with mothers requiring post-natal care, the hostel was soon turned into a special hostel for unmarried mothers from the services. They were admitted some considerable time before confinement, and returned there from the maternity home for as long as was necessary to settle them and their babies. You will understand the welfare work which was necessary and the help these girls needed.

Infant Welfare Centres

There were already in Hertfordshire 60 infant welfare centres holding regular sessions for consultation and advice on health problems. Centres were mostly held in church halls and other adapted buildings. These sessions were duplicated where possible, but on occasion the health visitor managed alone without a doctor in attendance, for we were very short of medical personnel. Where no doctor was regularly available, we collected "problems" and conveyed them to a nearby centre for medical advice. We used the infant welfare centres as distribution centres for orange juice, cod liver oil, and national dried milk, and so far as possible continued instruction on child care and health problems generally. Owing to staff shortages and lack of accommodation, this was given under great difficulties. Occasionally, in co-operation with the Ministry of Food, we were able to arrange for a domestic science demonstrator to visit centres to discuss food and cooking problems with the mothers. This demonstrator went equipped with a portable stove and sufficient materials to cook a specimen meal. As you know, food shortages were a great problem with us, and new ideas on making meals out of next to nothing were very welcome. We were helped a good deal in the running of these centres by voluntary committee members who prepared rooms for sessions, tidied up afterwards, and helped to give some kind of social welcome to the mothers by preparing and serving a cup of tea. The help of these voluntary workers was a great time-saver and made for a friendly atmosphere.

Home Visiting

Home visiting of children under the age of five years is an important part of our work and it was kept up to a fair standard. The increase of case loads made less frequent visiting the rule. The health visitors paid special attention to children under the age of one year, and then singled out children requiring particular care for fairly frequent visits. The majority of the children were wonderfully healthy and in regular attendance at the infant welfare centres. Mothers were to seek the advice of the health visitor if any problem arose.

School Nursing Service

You will remember the extra 20,000 children spread about the county sharing schools with our own children or being taught in temporary accommodation such as village halls, church halls, and the like. Enuresis, pediculosis, and scabies gave us our most spectacular health problem among school children. Billeting foster mothers had many such difficulties to cope with. A good many of them faced the problems, cleansed the children's heads, treated the skins, and made very little trouble about it. Enuresis was a more difficult problem requiring special measures. In nearly all cases of persistent enuresis, we found that the condition had existed before the war and evacuation. Where children could remain in billets, an extra supply of sheets and blankets and bed mackintosh helped a great deal. Otherwise, it was necessary for the children to be admitted to a special hostel which we called a "buffer hostel".

"Buffer Hostel"

The name "buffer" hostel really described those homes which tried to act as a buffer between the unhappy child and its problems, and the chaotic world outside. There were children who ran away from billets, those who felt they were allowed only on sufferance; others, particularly girls about twelve years, who showed anxiety for their parents, e.g. mothers doing war work and possibly in danger from air attack, fathers also on war work or perhaps away in the services; and those few, a hard core, who never saw or heard from their parents once they had been placed in the country. There is no doubt that some parents looked on billeting as a heaven-sent opportunity to escape their domestic responsibility, and, once having said goodbye to children at the reception centre in the town, had not the slightest intention of bothering further about them. The London County Council sent a welfare officer whose duty it was to maintain liaison between children and their homes. Every effort was made to give children help and guidance needed to cope with their problems. They were admitted to the hostel on the recommendation of the general practitioner, school nurse, or billeting officer. Where possible we collected a social worker's report on the family background in the child's own home, though owing to war conditions, a clear picture of this was not easily obtainable.

Health Supervision of Children in Schools

Then came the routine health supervision of children in schools, finding and dealing with medical defects, supervision of the children, and regular hygiene inspections. Inspections for the ascertainment of pediculosis, scabies, and other

personal problems were put into operation at once. The London County Council transferred a number of the school nursing staff to the reception area with various parties of evacuee children, and those nursing sisters were a wonderful help to us. They coped with the children in the big reception centres, helped at buffer hostels and cleansing stations, and were willing to deal with problems as they arose. Where there was no school nursing sister and a large number of evacuee school children, we gave auxiliary help to our own school nurses. This auxiliary would not be a qualified nurse but a person with nursing experience, such as a member of the Civil Nursing Reserve or the Red Cross. In other areas where the number of evacuees was not large, the Hertfordshire school nurse simply would extend her activities to include them. After a little while, medical inspections were introduced.

In order to bring this service into operation, Dr. Dunlop was able to arrange for the transfer of assistant school medical officers from London, or to appoint such additional help as it was possible for him to obtain. As a first step, the school nurse consulted with the senior teacher or head master of the London School, and school record cards were obtained from London. On receipt of these, the school nurse went through the records and sorted out the children in whom some defect had been found at a previous examination. These were the first to be seen by the school doctor, in the school if there was a sufficient number, or collected together from various schools at a convenient centre. Defects found were treated with as little delay as possible, and in this we had the help of the Emergency Medical Services, which allowed evacuee children to be treated at the Emergency Hospitals. The usual routine was followed of getting written consent of parent or guardian to any treatment needed. Then an appointment was made through the County Medical Department for the child to see a specialist and to be admitted to hospital. This routine was followed for all defects, i.e. vision, orthopaedic or psychological.

Minor Ailment Clinics

Before the war there were in Hertfordshire few permanent Minor Ailment Clinics for school children. Dr. Hyslop Thomson had always adopted the principle that children requiring medical advice or treatment of any kind should be referred to their family doctor. At this time medical inspection in schools was undertaken by a general practitioner who was also part-time medical officer of health and assistant school medical officer. This was thought to give continuity of supervision and care to the whole family.

Some school nurses established dressing clinics in surgeries attached to their own homes, and minor dressings were dealt with there. These were developed, and others established to include evacuee children, to become official Minor Ailment Clinics with a doctor in attendance. These carried on as a permanent fixture in the service.

Cleansing Stations

The treatment of scabies among civilians became a great problem. In order to deal with it effectively the Government introduced the Scabies Order. This made treatment compulsory if a cleansing order was issued. Verminous heads

were also dealt with here. Prior to the invasion of evacuee children we had not felt these stations really necessary, for although many country children lived in rural areas where amenities such as piped water and sanitation were sadly lacking, their general standard of cleanliness was very much higher than that of children attending the more crowded city schools. It was a source of great astonishment to us that families with a perfectly clean health record should suddenly become infected by scabies, and at one time this was a great problem and trouble to us. Sterilization of bedding was carried out through the Local Sanitary Authority.

Sick Bays

Again a large house was requisitioned for the purpose, run by the County Medical Department, and reserved for the care of school children. Many children not ill enough to justify admission to hospitals and those recovering from hospital treatment were admitted to these homes, where they were nursed back to full health before returning to billets. Scabies and minor ailment clinics were often attached to the sick bay, an arrangement which worked extremely well.

Diphtheria Immunisation

The names of children who had not been immunised were referred to their parents by the head teachers and consent obtained. Then special sessions were arranged, the children collected there and treated.

Dental Treatment

The County dentist made valiant efforts to bring evacuee children into the County schemes. Owing to shortage of staff this was not everywhere possible. In order to meet the need, special arrangements were made with private dentists who set aside special periods for evacuee children who could not attend County dental clinics. Emergencies were treated as they arose and though this may not have given 100% cover, the most necessary treatment and care was given.

School Meals

Before leaving the care of school children I should remind you of the meals service introduced by the education authorities. This was planned as normal policy following reorganisation of schools and was accelerated to meet the need of evacuee children. Provision of a hot meal at mid-day for school children not only helped with feeding problems at home, but relieved the billeting mothers of some responsibility for the children they had taken into their homes. Supervision of children and serving meals in school became an additional duty for school teachers already more than fully occupied by their large classes.

Residential Nurseries

This was the largest group of unaccompanied "under 5's". Day nurseries ordinarily working in London gathered their children together and brought them out to some large country house. The regular staff came too, and a great effort was made to preserve some sort of familiar background for the children. The mothers, all of whom were on war work of some sort, were thankful to see their small children safely in the country in the care of persons they knew. We hoped not to have small babies, but inevitably they came, often illegitimate, sometimes

having lost one or both parents. Again Hertfordshire's fine old houses came into use. A lovely house not far out of Hertford town, once the home of Prime Minister Gladstone, housed the "Port of London" Day Nursery. Mrs. Chancellor, a descendant of Mr. Gladstone, remained in part of the house, and we often called to mind the splendour of the days of 100 years ago, comparing what we had read of the period with the picture before us: small children clad in cotton frocks and knickers sent us by Canada, having a wonderful time rushing about, being as noisy as they liked and quite unrepressed. All this going on in a lovely room, once the drawing room, still furnished with the lovely **hand-painted wall-paper** put in when a wonderful ball was held in this house to celebrate Waterloo. I'm sure Mr. Gladstone turned in his grave.

I would like to say how much we appreciated and were grateful for the children's garments you kind people sent us at that time. This little store was a great help to us in fitting out children in nurseries. Owing to clothes rationing and scarcity, mothers were rarely able to send children out with sufficient clothing. Dr. Dunlop and I often wished for an opportunity to say publicly how much we appreciated this help. In particular, with reference to the dresses for children, we feel we would like to mention the pupils of Room 3, Harwood School, York Township, Toronto, who made dress and knicker sets. The garments were beautifully made and you cannot imagine the pleasure we felt when we dressed the little ones up in them. Many others sent layettes and second-hand clothes. In order to receive this clothing, I had to get myself registered as an importer. The garments had to be marked according to coupon value. Coupons were collected and I made a regular return to the Board of Trade.

We tried to maintain a high standard of nursing care in these nurseries by employing a fully qualified matron and a proportion of nursery-trained nurses, and by introducing a scheme for training nursery nurses. We adopted the two-year training curriculum and examination set by the National Society of Children's Nurseries. The County Education Department appointed a qualified nursery school teacher so that the educational needs of the children were met.

General health supervision was with the county medical officer through his assistants. A general practitioner was on call for emergency. With the help of my assistant, I was responsible for nursing staff recruitment and supervision and overseeing the training scheme.

Day Nurseries

Some forty day nurseries and nursery schools were established in the county for the children of mothers engaged in war work. As in the residential nurseries, administration was a joint responsibility between County Health and Education Departments. These nurseries were of two types, those covering the age group 0 to 5 years, and nursery schools taking the group 2 to 5 years. The matron was the responsible officer in the first group. She was always a State Registered Nurse with special experience in the care of healthy children. Where possible, we appointed an assistant matron with the same qualifications and a proportion of nursery-college trained nursery nurses. A nursery school teacher or warden took care of the educational side. In order to meet the need for nursery staff, the Ministry of Health introduced a special short training course in child care.

Recruits to this course formed the "Child Care Reserve", a very useful group of workers. The Board (now Ministry) of Education organised a similar course to augment the number of nursery school teachers, also in short supply.

The Nursery nurse training scheme introduced in the residential nurseries was extended to include the day nurseries, and it is pleasing to know that many of these day nurseries continue to function in Hertfordshire.

Social Needs for the older members of the community were in part met by the establishment of social clubs and rest centres. Health visitors were often able to help by visiting these clubs, where they listened sympathetically to the troubles of families living in crowded homes where sharing of kitchens and domestic offices brought strained relations and difficulties. Clubs such as this were usually organized by the W.V.S. (Women's Voluntary Services), who kept health visitors and nurses informed of members' health problems. Sewing classes, making or re-making garments, social activities such as card games, concerts, etc., all helped to preserve social adjustment in persons deprived of their own homes and familiar background.

With the exception of school meals, which were free only to the evacuee children, the services mentioned so far were all provided without payment, in very much the same way as they are now available through our National Health Service Act.

The one domiciliary service not given quite free was that of sick nursing in the home. At that time 'home' or as we called it 'district' nursing was organised by voluntary committees working in affiliation with the Queen's Institute of District Nursing. A membership fee from 4/- to 10/- a year, i.e. 1 to 2 dollars, gave the right of sick nursing at home in time of illness. Evacuees were given this service on production of a current up-to-date membership card from their own association. This worked well, and I know of no case where an incomer was not able to get nursing care needed.

You will see from this account that our most active work was with the group of school children. The majority of children of school age were unaccompanied, and it was quite natural that in this group the most serious emotional problems arose. Looking back on all this, it seems to me that keeping people physically healthy is not nearly so difficult a thing to do as preserving their emotional and mental health. In spite of overcrowded houses, large numbers of people sleeping in church halls, with poor ventilation as a result of blackout, a poorer standard of living because of food rationing, and a far greater strain because of longer working hours, the infectious disease rate and the general rate of illness did not rise as might have been expected. I cannot feel quite so happy about the psychological effect on the children of this transfer from their own home and family background during their most impressionable years. I would say that in this field the public health nurse, or health visitor, as we call her, could and did give her best work. Nurses who helped to staff first-aid posts in underground stations or large air-raid shelters were struck by the resistance of the population to cross-infection. I spent some nights myself at the first-aid post in Leicester Square Tube Station, where on one occasion very nearly 3,000 people slept on the station platforms. Sanitary provision was limited, and I am quite sure that the vast majority of the men sleeping there went out to work in the morning without

washing and with very little breakfast, but they just did not get ill, and I have never known why.

I hope that this is a factual description of life in the public health nursing world during World War II. Most of it is from memory, as I have not been able to go to Hertford to look up the records there, but I believe it to be fairly accurate. It is difficult to put on paper a really clear picture of the personal problems, discomforts and unhappiness experienced by persons of all ages removed from their family background and homes, living in a strange countryside during the confusion and anxiety of war. I hope most fervently that you will never have to cope with such problems, and that such interest as you find in this will remain purely academic.

Rocky Mountain Spotted Fever in Alberta, 1935-1950

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and

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ROCKY Mountain spotted fever is primarily a disease of small wild animals.

It is transmitted in nature by the spotted fever tick *Dermacentor andersoni* Stiles, the rabbit tick *Haemaphysalis leporis-palustris* Packard, and the dog tick, *Dermacentor variabilis* Say. The infection can be passed from stage to stage in the life-cycle of both the spotted fever and the rabbit tick. In Alberta man contracts the infection through the bite of an infected spotted fever tick. The causative organism is *Dermacentroxenus rickettsi* Wolbach, and the severity of the disease in man depends upon the virulence of the organism. It should be stressed that, according to Parker²⁰ in 1923, only about 2% of *D. andersoni* are infected with the spotted fever organism. But even this low percentage may constitute a menace, depending, of course, upon the relationship of the tick population to the human and wild animal population.

The spotted fever tick is well-established in southern Alberta (Fig. 1). It was first reported by Hewitt¹⁴ in 1915. Hearle¹³ in 1938, and Gibbons¹¹ in 1939 reported it as being present in large numbers in southern Alberta. Bow and Brown⁴ and Brown⁵ in 1943 recorded information on its importance as a disease vector. Brown and Roy⁶ in 1943 recorded it as an ectoparasite on *Citellus richardsonii* Sabine, the prairie gopher. Brown⁷ in 1944 and Brown and Kohls⁸ in 1950 reported on its distribution in the province.

HISTORICAL

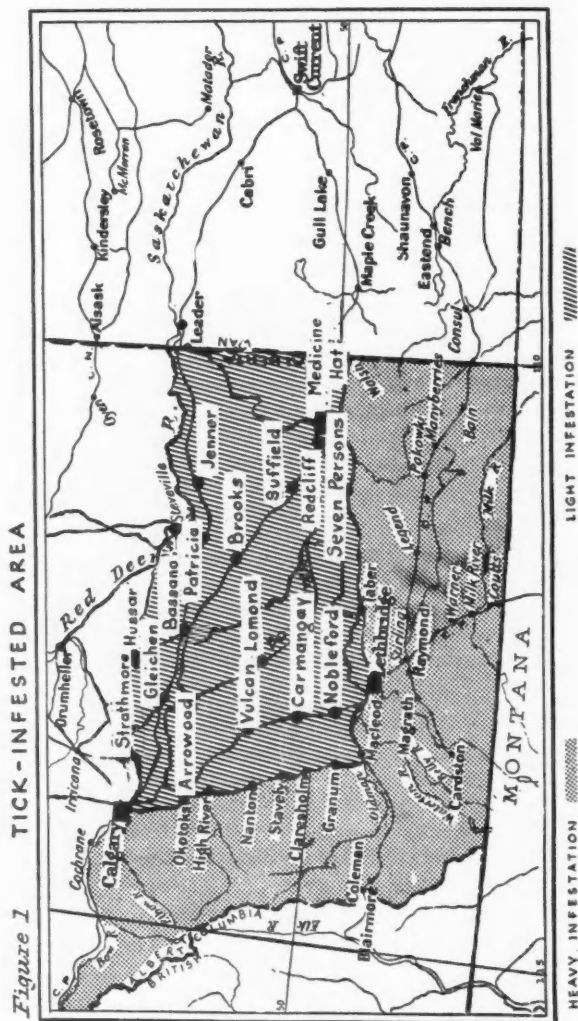
Rocky Mountain spotted fever was first reported from Montana in 1873. In 1896 Wood²⁰ gave a detailed account of the disease in Idaho, and this was followed in 1899 by Maxey's report¹⁷ on Idaho cases. The disease was then known as an infection peculiar to the mountainous regions of Montana and Idaho, and was referred to as Rocky Mountain typhus fever, and the "blue disease". Its mode of transmission was unknown.

In the period 1902 to 1904 Wilson and Chowning²⁷ advanced the theory that it was a tick-borne disease. In 1906 Ricketts²³ proved this theory to be correct and demonstrated that both the male and female tick could transmit the infection.

¹Deputy Minister, Department of Public Health, and Professor of Public Health, University of Alberta.

²Entomologist.

In 1906 King¹³, carrying out an independent investigation, confirmed Ricketts' findings. In 1907 Ricketts²⁵ indicated that spotted fever was primarily a disease of small wild animals. Maver¹⁶ in 1911 demonstrated that the dog tick *Derma-centor variabilis* Say could transmit the infection. Parker¹⁸ in 1918 pointed out



the relation of tick abundance to jackrabbit population, and recorded that Wolbach had demonstrated that jackrabbits were susceptible to spotted fever. In 1923 Parker¹⁹ recorded the rabbit tick *Haemaphysalis leporis-palustris* Packard, as a transmitter of the infection in nature. Wolbach, Pinkerton and Schlesinger in 1923 reported the culturing of the spotted fever organism, *D. rickettsi*.

In 1923 Parker²⁰ recorded the stage-to-stage transmission of the spotted fever organism in the life-cycle of both *D. andersoni* and *H. leporis-palustris*. In 1928 Parker²¹ reported that spotted fever infection involved about one-eighth of the continental United States, particularly the central and western states.

Remreich, Dyer and Badger²⁵ in 1931 recorded the occurrence of spotted fever in Eastern United States, and in the same year Dyer, Badger and Rumreich⁹ reported on the transmission of the infection by the dog tick *D. variabilis*. In 1932 Badger¹ collected naturally infected dog ticks in Virginia.

Parker *et al.*²² in 1937 recorded that spotted fever in man occurred in early spring and summer in the *D. andersoni* range, and during the late spring and summer in the *D. variabilis* range. In 1938 Bishopp and Smith² gave a detailed account of the importance and occurrence of the dog tick *D. variabilis*, in the eastern United States.

Hearle¹² in 1938 reported that two cases of spotted fever, one of which was fatal, had occurred at Manyberries, Alberta, in 1936. Gibbons¹⁰ in 1938 reported eight cases as occurring in Alberta from 1923 to 1938, with three being fatal. Bow and Brown³ in 1945 recorded six known cases and one suspected case, with three fatalities, in the period 1935 to 1943.

CLINICAL PICTURE

The following description is taken from *Viral and Rickettsial Infections of Man*²⁶ (J. B. Lippincott Company, 1948), by permission of the publishers.

"In many of its general aspects, Rocky Mountain spotted fever resembles typhus, the chief differential points being the duration of fever and the time of appearance and location of the rash. Attacks range from mild ambulatory and abortive forms to rapidly terminating fatal infections. The fatality rate varies in different regions.

"The following description is based on the appearance of the disease as it occurs in non-vaccinated adults. In vaccinated persons and young children, attacks are frequently mild and atypical. The incubation period ranges from 2 to 12 days but averages 6 or 7 days. The actual onset, like that of typhus, may be preceded by a few days of ill-defined symptoms—listlessness, loss of appetite, and headache. Onset is commonly abrupt with chills, profound prostration and a rapidly rising fever that continues to mount into the second week. Myalgia and arthralgia are marked and in the more severe forms epistaxis may occur early. Remissions of 1 to 3 degrees (F.) are observed in morning temperatures. The fever terminates by rapid lysis, usually at about the end of the third week, although mild cases may become afebrile before the end of the second week. (Fig. 2) shows temperature respiration and pulse-rate curves of a typical case of Rocky Mountain spotted fever.

"A distinctive rash usually appears on the third or fourth day which resembles the slight mottling seen in early measles. This fades shortly to be followed by typical, rose-red, maculopapular lesions characterized by first appearing on the ankles and wrists and rapidly spreading to the legs, arms and chest. The palms and soles and at times even the face and scalp become involved. The abdomen is the last and least affected. Early in the course of the disease, the spots are less pronounced during morning remissions of fever but become progressively more distinct each day until they are definitely petechial in all but the mildest types of infection (Fig. 3). In severe cases the spots are confluent, deep red or purplish in color and often necrotic. In convalescence the rash in brownish and branny desquamation, occurs over the more heavily involved areas.

"There are no significant hematologic changes. The white cell count usually does not exceed 15,000 per c.mm. but may go as high as 30,000. Nervous manifestations are common and include headache, restlessness, insomnia, confusion and coma; delirium occurs in severe

cases. In fulminating cases, coma usually precedes death, which commonly occurs around the end of the second week of illness. Convalescence is slow even in the mild cases and complete recovery, particularly from severe infection, may require several months and sometimes even a year or longer. Disturbances of sight, hearing and mental acuity are not uncommon, and various symptoms associated with vascular damage may be observed. It is generally considered that persons having recovered from spotted fever are more or less permanently immune."

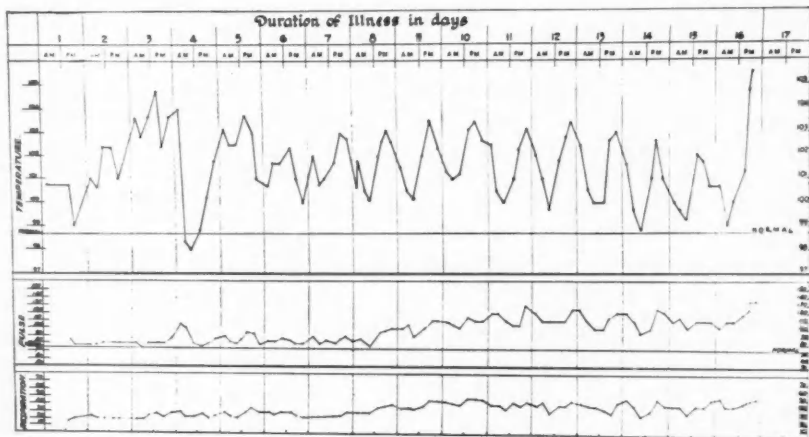


FIG. 2. Chart of R.M.S.F. in 82-year-old male. The case terminated fatally on the 16th day of illness and 19 days after tick bite. (Mr. P. A. Y., Medicine Hat, Alberta, 1942)

CASES

There is considerable confusion in regard to the actual number of cases of this disease that have occurred in Alberta, and also to the date of the first case.

To date a total of nine known cases and four suspected cases of this infection in man have been reported. Five of the cases were fatal.



FIG. 3. Typical rash. Alberta case that subsequently recovered.

Six of the known cases occurred in the Manyberries area. Four of them (1, 2, 3, and 6), all fatal, originated on the North Branch of the Manyberries Creek adjacent to the town of Manyberries, while the other two (5 and 7) originated in small coulees located two and five miles respectively to the northwest of the town.

Two of the known cases (8 and 9) developed following tick bites contracted on the north bank of the South Saskatchewan River west of the town of Redcliff. The persons involved were husband and wife. The husband died shortly after admission to hospital.

The other known case (5) originated in a coulee south of Medicine Hat. This patient recovered.

Two of the probable cases (11 and 12) occurred at Calgary, but to date no infected ticks have been found in that area. Another probable case (10) originated at Milk River in 1935. This area was always considered to be free of infected ticks, but in 1947 ticks infected with a mild strain of spotted fever were recovered. Case 13 is still under study. There is some evidence that this man visited a known spotted fever infected area previous to becoming ill.

Protective measures against spotted fever infection through personal care and vaccination are well known, and have been practised for the last ten years. These measures are for the protection of human health and do not prevent in any way the maintenance, perpetuation or increase of mammals and ticks infected with spotted fever, or the extension of areas harbouring them.

ACCEPTED CASES

1. H.E., an elderly farmer living on the North Branch of the Manyberries Creek. Admitted to Medicine Hat General Hospital July 25, 1935. Died July 30, 1935.

Diagnosis: Rocky Mountain spotted fever. Dr. H. C. Dixon.

2. J.C., age 61, farmer living on the North Branch of the Manyberries Creek. Admitted to Medicine Hat General Hospital July 21, 1936. Died August 1, 1936. Diagnosis: Rocky Mountain spotted fever. Dr. F. W. Gershaw.

3. L.L., a young married man living on the North Branch of the Manyberries Creek, took sick following tick bites. Died 1936.

Diagnosis: Rocky Mountain spotted fever. Dr. J. H. Duncan.

4. J.M., age 55, farmer living one mile west of the North Branch of the Manyberries Creek. Admitted to Medicine Hat General Hospital on June 29, 1936. Was discharged July 31, 1936, upon recovering.

Diagnosis: Rocky Mountain spotted fever. Dr. F. W. Gershaw.

5. E.B., 18-year-old male living in Seven Persons Coulee near Medicine Hat, entered the General Hospital in the early part of July, 1940. Discharged August 11, 1940. Recovered.

Diagnosis: Rocky Mountain spotted fever. Dr. W. C. Campbell.

6. P.A.Y., 82-year-old male of Medicine Hat, was admitted to Medicine Hat Hospital June 23, 1942, as a result of tick bite while visiting Manyberries. Died July 8, 1942.

Diagnosis: Rocky Mountain spotted fever. Dr. J. Corley.

7. M.F., 55-year-old male living northwest of Manyberries, was admitted to Medicine Hat Hospital in early June, 1943, following a tick bite. Discharged as recovered.

Diagnosis: Rocky Mountain spotted fever. Dr. W. C. Campbell.

8. L.E.S., elderly male of Redcliff, contracted Rocky Mountain spotted fever on May 17, 1944. Died May 24, 1944. Dr. J. R. Patterson.

9. Mrs. L.E.S., elderly female of Redcliff, took sick on May 25, 1944. Recovered and discharged on July 4, 1944.

Diagnosis: Rocky Mountain spotted fever. Dr. J. R. Patterson.

PROBABLE CASES

10. J.G., a young married woman living at Aden, near Milk River. Contracted what is thought to have been a mild case of spotted fever from tick bites during 1935. Recovered. Dr. H. B. Hunt.

11. W.B., young male, in 1940 became ill following tick bites. Recovered. Calgary.

12. M.T., female age 21, in 1940 became ill following tick bites. Recovered. Calgary.

13. C.L.T., 41-year-old male of Wrentham, was admitted to Raymond Hospital June 16, 1950, following tick bite. Discharged June 20, 1950, as recovered. Diagnosis (clinical basis). Dr. H. Taylor.

ABSTRACT

Nine known and four suspected cases of Rocky Mountain spotted fever are recorded from Alberta. All the cases gave a history of tick bites, and all occurred in the spotted fever tick, *Dermacentor andersoni* Stiles, area.

Five of the known cases were fatal. Four of the fatal cases were contracted on the North Branch of the Manyberries Creek at Manyberries, while the fifth was contracted on the north bank of the South Saskatchewan River west of Redcliff. Ticks infected with the spotted fever organism, *Dermacentor rickettsi* Wolbach, were recovered from the areas where the known cases occurred.

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Dental Care of the Pre-School Child

GEORGE K. CLARKE, D.D.S., D.D.P.H.*

Ottawa, Ontario

A dental-care program for the pre-school child is of the utmost importance in any community. The increasing thought, interest and effort that is being directed toward this phase of dental health work is indicative of the recognition it is receiving from many public health departments.

A well-planned program for pre-school children is, in our opinion, the most important initial project to be undertaken by a dental health division. It is basic in its design and intent. It is applicable during the period in the child's impressionable life when sound oral health habits can be instituted; and it is also the period in the parents' life when they will most readily accept advice for the benefit of the child.

Our experience in this type of program in the dental public health field has led us to certain conclusions that are somewhat more than tentative.

In this short paper I would like to outline a few considerations in our pre-school program that indicated to us this importance.

It is not my intention to minimize the rightful place of school educational programs. These are necessary and are effective; their effectiveness does depend in a large measure on the enthusiasm of the principals and teachers. Now a child properly taught oral health procedures in a school can so easily have his interest and his practice of those procedures quickly dampened if co-operation is not received from the parents. At the same time I realize that meetings of parents are organized to keep parents informed, but all too often the parents who attend those meetings are ones who least of all need the information. Again let me repeat, I recognize the necessity for a thorough-going school program but merely want to point out breaks that may appear in the chain by group education.

Because of the educational value of direct and personal contact with parents, I consider the pre-school program to be of first importance in a community. In this program, as in the school program, the nurse can and should act as teacher and counsellor if the program is to succeed. Her influence is continuous and constant. In communities where there is no dental health officer, her responsibilities are even greater.

In a child health centre contact with the mother and child is personal. The mother is made to feel that the interest of all the professional personnel present is focused on the health of her child, which in itself is a stimulus to her interest. The environment of the health centre lends weight and should be utilized to the fullest degree.

Presented at a joint session of the Public Health Nursing Section and the Public Health Dentistry Section at the thirty-ninth annual meeting of the Canadian Public Health Association, held in Montreal May 28-31, 1951, in conjunction with the annual meeting of la Société d'hygiène et de médecine préventive de la province de Québec.

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From here I wish to outline the procedure used in Halton County, Ontario. This is presented to you for what it is worth and not with the assumption that we have all the answers.

In our health unit we have found increasing interest on the part of mothers in dental counselling. They voluntarily return to us two or three times to have certain problems discussed and the educational material reviewed.

When we started the project, mothers with infants two and three months old were amused at our concern over the dental health of children who had no teeth. In fact, we are most interested in the infant before tooth eruption; because it is in this period that we can best plan a program for preventive dental care.

Our informal talk with mothers is a quick review of the dental milestones that a child passes by.

(1) Pre-natal care is first of all considered for that value it might have in the future.

The following points are emphasized:

(a) The teeth of the primary dentition begin to form about the fourth month of pregnancy.

(b) Nutrition of the mother is important for the maintenance of her oral health—gingival tissues, surrounding bone, etc.

(c) Strict observance of oral hygiene during pregnancy.

(d) The necessity of having the mother's dental work done early in this period—including fillings, partial dentures, periodontal treatment and extraction of abscessed teeth. All this, of course, is in co-operation with the attending physician.

(e) That the crowns of all twenty deciduous teeth are calcified at birth and that their development depends largely on adequate nutrition. Most mothers are surprised to learn that once a tooth has erupted nothing can be done nutritionally to strengthen the enamel. This point lends emphasis to a sound pre-eruptive dietary.

(f) The eruption period with the signs and symptoms that are sometimes alarming to parents are reviewed: fretfulness, sleeplessness, salivation, loss of appetite, temperature, swollen and inflamed gums; these points are reviewed and recommendations made.

In this regard we advise against force-feeding and the lancing of gums.

Mothers come to us somewhat alarmed because the child is ten months old and no teeth have appeared.

It is part of the counsellor's *job to allay* unnecessary fears.

We advise mothers not to worry about eruption even up to a year; the important thing is that by the time the child has reached 2½ or 3 all the primary teeth will, in all probability, be in their proper place.

If parents are warned of what they may expect, much of their anxiety is overcome and this we believe is an important function of the dental health worker.

(g) When the child has four teeth in the upper and lower jaws, we advise the commencement of proper toothbrushing at the conclusion of each feeding.

The value of this procedure at such an early age is primarily designed to initiate the habit. This, we realize, is often difficult and time-consuming; but if conscientiously followed, by the time the child has all of his primary teeth the habit is well established.

(h) At this point we discuss correct toothbrush technique and the importance of cleaning teeth immediately following the meal or snack. Diagrammatically and in simple terms we illustrate the mechanism of dental decay—the breakdown of carbohydrates within the bacterial plaque and the activity and character of the organism shown to be associated with the disease. This might seem unnecessary but it has been found that the explanation of the phenomenon emphasizes the necessity for immediate cleansing of teeth. Then, too, this explanation is a direct lead into the discussion of sweets, and the control of concentrated sweet foods, particularly for in-between-meal and bedtime snacks.

(i) Leading nutritionists and dentists are in agreement that the control of concentrated carbohydrates is essential to reduction of dental caries. This problem is our most serious one. As dentists we realize that the elimination of concentrated carbohydrates from our dietary would answer the problem of dental caries. However, as realists we also appreciate that this is impossible to accomplish. The opposing factors are too many and too strong.

In our campaign for the reduction of sugar intake in its popular forms, we have accepted and follow the advice of professional teachers. Our attempt to influence children and parents is by way of suggesting alternative foods which at the same time are nutritious and attractive. With sincere parent co-operation, some measure of success can be made by eliminating sweet foods from the in-between-meal and bedtime snacks.

In place of jam sandwiches, etc., we suggest peanut butter, meat or cheese sandwiches; for cookies and pastry, fresh fruit; for candies, we recommend peanuts, popcorn or potato chips; whole milk (not chocolate milk) in place of soft drinks; raw vegetables are also included.

The candy and gum problem is obviously one we will not solve by merely saying "don't". It seems to us a far wiser course to demonstrate visually to parents of the pre-school child the result to be expected from the unrestricted use of hard, sticky candy and gum. In the case of these confections we are dogmatic and recommend complete elimination from the child's dietary. But as the child grows older and it becomes increasingly more difficult to deny him candy, we suggest that as an occasional treat chocolate or soft candy after a meal would do the least harm. This, of course, is assuming that the practice of immediate brushing and rinsing is followed. The whole problem of sugar restriction could fill many hours of discussion.

A consideration of dental care for the pre-school child would be incomplete without reference to dental treatment. No attempt can be made here to deal adequately with all the aspects involved in a treatment program, whether by family dentist or dental clinic.

Certainly the most desirable method for carrying out dental treatment on the pre-school child is by the family dentist.

Let us briefly consider two main points: (1) the attitude of the family

group toward the dentist, and (2) the responsibilities of the family dentist toward his community.

In the first instance, parents bear a great responsibility in the development of a healthy attitude towards the dentist.

A child cannot be expected to approach a dentist with confidence on his first visit if he has been forced to listen to adults describe in detail their experiences in a dental chair. These over-stated experiences, incidentally, are invariably the result of their own neglect.

We caution parents in this regard and make the following suggestions:—

(1) By the time the child has all of the primary teeth present in the mouth, which is usually by $2\frac{1}{2}$ to 3 years of age, the child should make the first visit to the dentist.

(2) We suggest that the child accompany the mother on one of her visits to become acquainted with the dentist, the nurse and the office. Then the numerous gadgets are not unfamiliar to him, or a source of dismay.

(3) Before the child's first appointment day arrives he should be casually told that the dentist is going to look at his teeth and let the matter drop there. If he asks what the dentist will do, he should be told the truth about the examination but should not be told that the dentist will not "hurt." That word "hurt" should be entirely omitted.

(4) Once in the dental office, we advise parents to remain in the reception room unless the dentist requests their presence. It is so much easier to gain a child's confidence when alone without the sympathetic "help" of a nervous mother.

The parents' responsibility to the family dentist is to not over-prepare the child for dental treatment.

If treatment is started early in life with considerate co-operation from the parents and frequent periodic examinations thereafter, there is no reason, under modern operating conditions, why the child should be apprehensive or difficult to manage.

The responsibility of the family dentist to his community is a serious one.

Probably none of the health professions has experienced such marked changes in the objectives of treatment as has the dental profession. In a few short years the main interest has shifted from mechanical repair to prevention—from a skilled art to a biologic science. The standards of dentistry, therefore, have changed and will continue to change as progress is made in the development of new preventive and control methods.

Minimum standards of dental care are no longer acceptable, as minimum standards can only produce a low standard of dental health.

Every thinking dentist fully appreciates his own position with regard to his pre-school age patient. The degree to which his conscientious effort is directed toward these patients is in a large measure influencing the opinion of the public and the future status of the profession.

State medicine or dentistry is not, we believe, in the best interests of the public need. The sum total of the dentist's individual effort toward his own community will influence the future position of the profession.

The family dentist has the same opportunity to widely influence the families

he serves, by the same chair-side preventive education talks as the public health dentist uses in the clinic. This is as much a responsibility as the skilful insertion of a filling.

As dentists we must realize that the public does have a stake in the practice of preventive procedures and we must learn to respect the public's viewpoint. It is admitted that the dentist is the authority in matters pertaining to dentistry; in the economic aspect, it is becoming clear that the consumers—the people themselves—are demanding equal rights and have equal concerns. The costs of dental care, how it will be paid for, how it will be made available to increasing public demand—these are all questions which we as a profession must satisfactorily answer if we wish to avoid any form of state control.

The responsibilities of the family dentist to the family group include, then, the highest possible standards of practice coupled with education and an economic concern with respect to the profession as a whole.

A plan for the dental care of the pre-school child would include (1) an organized educational program conducted by nurses and/or dentists within the framework of a public health department, and (2) the institution of preventive dental care program at the age of 2½ or 3 years.

Diphtheria Antitoxin Titres Following a Recall Dose of Diphtheria Toxoid

A THREE-YEAR STUDY

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C. W. CARR, M.B.²

and

L. KATHLEEN JACKSON, B.A.³

THIS study is a continuation of work previously reported¹ in which the antitoxin response of various groups to recall doses of diphtheria antigen ranging from 0.001 to 40 Lf was recorded. In certain of the groups the antitoxin levels were ascertained as long as three years after the recall dose, but the number of individuals in each was small. It was felt that information about larger groups over a similar period following different recall doses was desirable. Observations were therefore extended to three years in two groups of school children whose early response to 3 Lf of fluid diphtheria toxoid in the one case and 40 Lf in the other was presented in the previous report. In addition, data were obtained following a 1-Lf dose administered to members of a medical class the great majority of whom were ex-service personnel with a history of immunization against diphtheria.

METHOD

For details concerning the two school groups the previous paper should be consulted. Blood samples were obtained before and at two weeks and one, two, and three years after the 3 and 40 Lf recall doses.

Following a preliminary blood sample, each medical student was given, subcutaneously, fluid diphtheria toxoid diluted to contain 1 Lf in 0.4 cc. Further blood samples were taken five weeks and one, two, and three years later.

For various reasons the number and individuals in the three groups available for bleeding at the various intervals was subject to some fluctuation.

Antitoxin titres were determined by the Fraser modification of the Römer test² and are presented below in tabular form.

RESULTS

School Groups (3 and 40 Lf)

Tables I and II present the distribution and geometric mean of the titres at the various times of bleeding for the 3-Lf and 40-Lf groups.

Considerations relating to the early response in these two groups were discussed in the previous paper.¹ It is obvious that each dose of toxoid was highly

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TABLE I
DISTRIBUTION OF ANTITOXIN TITRES BEFORE AND AT VARIOUS INTERVALS AFTER 3-LF RECALL DOSE OF FLUID DIPHTHERIA TOXOID

Times	<0.001	0.001	>0.001<0.01	0.01	>0.01<0.1	0.1	>0.1<1	1	>1<10	10	>10<100	Total	Geometric Mean of Antitoxin Titres
0	5		6		19	2	7		2			41	0.046
2 weeks			2				10	2	24	2	1	41	1.63
1 year	1				5		14	1	11			32	0.59
2 years	1		1	2	3		9		7			23	0.31
3 years	3		1		3		7	1	5			20	0.19

TABLE II
DISTRIBUTION OF ANTITOXIN TITRES BEFORE AND AT VARIOUS INTERVALS AFTER 40-LF RECALL DOSE OF FLUID DIPHTHERIA TOXOID

Times	<0.001	0.001	>0.001<0.01	0.01	>0.01<0.1	0.1	>0.1<1	1	>1<10	10	>10<100	Total	Geometric Mean of Antitoxin Titres
0	2		11		10	3	11		1			38	0.052
2 weeks					3		3	1	19	2	10	38	4.09
1 year					2		9	1	13		1	26	1.25
2 years			1		2	1	11	1	5			21	0.50
3 years					4		13		3			20	0.45

effective but 40 Lf was superior to 3 Lf in terms of antitoxin titres evoked. The difference was found to be statistically significant. When comparison is continued over the years following the post-recall peak, it is apparent that the margin of superiority is somewhat reduced. This is accounted for by a slightly greater loss of antitoxin in the first and second years by the 40-Lf group. At the end of the three-year period the average antitoxin titre for this group was still notably higher than it was for the 3-Lf group and was 8.7 times the initial titre, in contrast to 4.1 times in the latter group.

It is important to note that the number of persons in each group, not large to begin with, had decreased to approximately half by the end of three years. This may well have introduced a factor of selection and distorted the picture in some measure. In any case, of the 20 persons available for final bleeding in the 40-Lf group none had < 0.01 units, whereas 4 of the 3-Lf group, or 20%, had < 0.01 and 3 of these < 0.001 unit.

Serum samples were obtained from 11 persons of the 3-Lf group and 10 of the 40-Lf group at the end of four years. Since these small numbers do not constitute reasonable samples, the results are not included in the tables. The average titres and distribution varied little from the three-year findings.

Medical-Student Group (1 Lf)

Table III shows the number of persons at the different antitoxin levels for each bleeding, together with the average antitoxin unitage.

A marked shift to higher antitoxin titres is apparent at five weeks after the recall dose and an increase in the average antitoxin titre from 0.06 to 1.44 units. The latter represents an approximately twenty-four fold increase and may be interpreted as a very satisfactory response to the small stimulus given.

The decline in antitoxin levels from the post-recall peak was sharp, amounting in the first year to approximately 76%. Over the following two years the loss of antitoxin was much less and the average titre at the final titration was approximately 3.7 times the initial average. At the end of the three-year period 86% had > 0.01 unit, in contrast to 70% initially and 94% at the post-recall peak, and 22% had > 1 unit in contrast to 11% initially and 60% five weeks after the recall dose.

Table IV supplements the information given in Table III by showing the titre of each individual before and five weeks after the recall dose, thus revealing the individual variation in antitoxin response.

It is apparent from Table IV that 20 persons had, initially, < 0.001 unit and that 8 of these failed to respond. The table suggests that 10 others who had $> 1 < 10$ units also failed to respond. Actually, the sera in these cases were re-tested at $> 1 < 5$ and $> 5 < 10$ units and only 3 gave no detectable response. It is possible that an increase in antitoxin did occur in these 3 cases but was not shown within the limits of our test. That persons with a relatively high level of antitoxin may show no apparent response to a small stimulus has been noted previously.¹ In any event, with such titres, it is not a matter of practical concern. When the failure to respond occurs in individuals with little or no antitoxin, it becomes more significant. Of the 20 with < 0.001 unit 12 responded, and one

TABLE III
DISTRIBUTION OF ANTITOXIN TITRES BEFORE AND AT VARIOUS TIMES AFTER A 1-LF RECALL DOSE OF FLUID DIPHTHERIA TOXOID

Times	<0.001	0.001	>0.001<0.01	0.01	>0.01<0.1	0.1	>0.1<1	1	>1<10	10	>10<100	Total	Geometric Mean of Antitoxin Titres
0	20	1	20	3	37	21	30	1	16			149	0.060
5 weeks	8		1		7	1	34	6	65	3	18	143	1.44
1 year	9		7	1	27	1	50	4	40	1	5	145	0.35
2 years	7		10	1	26	2	51	2	35	1	3	138	0.30
3 years	7		10		30	1	42	3	25		1	119	0.22

TABLE IV
INCREASE IN ANTITOXIN TITRES AT 5 WEEKS AFTER
1-LF RECALL DOSE OF FLUID DIPHTHERIA TOXOID

		No. of Persons with Initial Antitoxin Titres of									TOTALS
		<0.001	0.001	>0.001<0.01	0.01	>0.01<0.1	0.1	>0.1<1	1	>1<10	
No. of Persons 5 weeks After Recall Dose with Antitoxin Titres of	<0.001	8									8
	0.001										
	>0.001<0.01	1									1
	0.01										
	>0.01<0.1	5		2							7
	0.1			1							1
	>0.1<1.0	3	1	12		11	7				34
	1			1	2	2	1				6
	>1<10	3		3	1	16	10	21	1	10	65
	10			1		1		1			3
	>10<100					4	2	6		6	18
TOTALS		20	1	20	3	34	20	28	1	16	143

may take for granted a previous diphtheria experience. Among the 8 failures 3 almost certainly (according to history) had had diphtheria toxoid at some time, 2 had definitely not had toxoid, and the other 3 were doubtful.

Thus, in all, 11 of 143 or 7.7% failed to respond to the 1 Lf dose. However, if we accept as failures only the 3 of those with $>1 < 10$ units and 3 of the 8 with < 0.001 , then 6 or 4.2% did not respond. It is, then, reasonable to suggest a response rate of approximately 95%. The degree of response was highly variable: no increase in antitoxin, little increase, and a marked increase.

In Table V the number of persons in each antitoxin bracket at five weeks and three years after the recall dose is shown. The loss of antitoxin for each individual from the post-recall peak to the final titration is revealed.

Approximately 20% retained the titre reached following the recall dose. The majority showed some degree of antitoxin loss varying from slight to great.

TABLE V
CHANGE IN ANTITOXIN TITRES OVER 3-YEAR PERIOD FOLLOWING
1-LF RECALL DOSE OF FLUID DIPHThERIA TOXOID

		No. of Persons with Initial Antitoxin Titres of										TOTALS	
		<0.001	0.001	>0.001<0.01	0.01	>0.01<0.1	0.1	>0.1<1	1	>1<10	10		>10<100
No. of Persons 3 years After Recall Dose with Antitoxin Titres of	<0.001	7						1					8
	0.001												
	>0.001<0.01			1		4		4					9
	0.01												
	>0.01<0.1					1	1	18	3	5		1	29
	0.1									1			1
	>0.1<1							5	2	31		1	39
	1									3			3
	>1<10									13	1	10	24
	10												
	>10<100											2	2
TOTALS		7		1		5	1	28	5	53	1	14	115

However, apart from the 7 persons with < 0.001 unit who had failed to respond, 89% had > 0.01 unit and 25% had 1 unit or more at the end of three years.

DISCUSSION

The early response, as gauged by the average antitoxin titre attained, was satisfactory in all three groups. In the comparable school groups 40 Lf was significantly superior to 3 Lf, a result in general agreement with findings in relation to tetanus toxoid where 10-Lf and 1-Lf doses were evaluated.^{3,4} Likewise, though the groups are not comparable in several respects, the 3-Lf dose stimulated greater diphtheria antitoxin production than the 1-Lf dose. These results were to be expected.

When the results are gauged on the basis of individual instead of average titres, it is evident that the 1-Lf dose failed to provoke a response in the 3 indi-

viduals with < 0.001 unit initially who had apparently had toxoid previously. There were no exceptions where the doses of 3 and 40 Lf were concerned.

Over the three-year observation period a marked decline in antitoxin levels occurred in all three groups, with the net result that the final average titre was 8.7, 4.1 and 3.7 times the initial average in the 40-Lf, 3-Lf and 1-Lf groups. On this basis the marked superiority of the large recall dose, apparent early, is to some extent lost with the passage of time. The individual pattern of antitoxin loss is a variable one. In all groups there are persons in whom the loss is rapid; in the majority it is gradual; and in some the high levels reached are maintained with little or no loss.

It may fairly be argued that the large recall dose should be adhered to, since few if any would decline to levels where their immunity status would be in doubt over a period of years. However, in view of the highly effective stimulus of a small dose, say 3 or 4 Lf, which may in our experience be given without a reaction test in school age groups, the smaller dose is possibly to be preferred for community programs. This position is in keeping with the view that if a large majority are immune there is little risk of diphtheria.

In testing the efficacy of a 1-Lf recall dose, it was not our thought that this amount should be recommended even if found to provoke a consistently good response. Rather, it was felt that if the results were favourable, it would strengthen one's confidence in the suggestion previously made that 4 Lf constitutes a practical and satisfactory recall dose for certain age groups. This would seem to be the case in view of the findings recorded above for the 1-Lf dose.

SUMMARY AND CONCLUSIONS

A recall dose of 40 Lf of fluid diphtheria toxoid is appreciably superior to 3 or 1 Lf in terms of the immediate antitoxin response. The latter are, however, highly effective in the great majority of persons.

Over a three-year period some of the superiority of the 40-Lf dose is lost in that the decline in antitoxin titres is greater where higher levels are reached.

In view of the relatively good response resulting from the 3- and 1-Lf recall doses and the fact that these may be given without a prior reaction test, the use of 3 or 4 Lf as the recall dose for school-age groups, as previously recommended, may be continued with renewed assurance.

ACKNOWLEDGEMENTS

It is a pleasure to record our thanks to Dr. D. T. Fraser and Dr. P. J. Moloney for their assistance throughout this study and to Mr. D. B. W. Reid for his guidance in the preparation of this paper.

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Cardiolipin Antigens in the Serodiagnosis of Syphilis

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THE isolation of the phospholipid, cardiolipin, from beef heart was announced by Pangborn¹ in 1941. Since the pioneer days in the field, it had been the ambition of many workers to isolate the serologically active substance or substances from beef heart extracts. It was reasonable to hope that a purified antigen would be more efficient in the detection of the syphilitic case and in the exclusion of the nonsyphilitic individual. Pangborn and coworkers found that cardiolipin by itself was not serologically active; but if lecithin and cholesterol were added to a solution of cardiolipin in proper proportions, the mixture could be used as antigen in the serodiagnosis of syphilis. Cardiolipin antigens were soon being used experimentally in many of the better known tests for syphilis.

Sensitivity and Specificity

The efficiency of cardiolipin antigens in the detection of syphilis is generally accepted. Indeed, it is possible to prepare mixtures with sensitivity levels considerably higher than those of the lipoidal antigens presently in use in Canada.

There are differences of opinion regarding the specificity of cardiolipin antigens. For example, Kline² has found the purified antigen to be considerably more specific than beef heart extract antigens. On the other hand, McDermott and Kahn³ have called attention to the fact that in the National Serologic Evaluation Survey conducted by the United States Public Health Service in 1949, the incidence of false positive reactions was greater with tests employing cardiolipin antigen than with the standard Kahn test using Kahn antigen. On the whole, it would seem that cardiolipin antigens are at least as specific as the older antigens when the sensitivity levels of the two types of antigen are comparable. There is general agreement that the purified antigens are more specific when specimens from individuals with malaria are tested.

Ease of Standardization

Different batches of cardiolipin seem to possess the same serological reactivity per unit amount. The preparation of uniform batches of lecithin from beef heart is more difficult, and with different lots of lecithin it may be necessary to adjust the quantity in the antigen mixture in order to maintain a constant level of

Presented before the Venereal Disease Control Section at the thirty-ninth annual meeting of the Canadian Public Health Association, held in Montreal, May 28-31, 1951, in conjunction with the annual meeting of La Société d'hygiène et de médecine préventive de la province de Québec.

sensitivity. This difficulty is experienced chiefly with flocculation tests and is usually not serious when complement fixation methods are being employed. More recently, Pangborn⁴ has developed a method for the preparation of lecithin from egg yolk, and it is claimed that with this method there is a constancy in serological reactivity from batch to batch. A method for the synthesis of lecithins has been developed by Baer and Kates.⁵ These lecithins are saturated, in contrast to the naturally occurring unsaturated lecithins prepared from beef heart or egg yolk. From preliminary studies performed by Rosenberg⁶ and by Kline⁷ and at this laboratory it has been found that the saturated lecithins can be used in the preparation of cardiolipin antigens. More intensive studies are necessary to determine the usefulness of the synthetic lecithins.

CHOICE OF AN OPTIMUM LEVEL OF SENSITIVITY

Cardiolipin antigens with different levels of sensitivity can be prepared by altering the proportions of the three components (cardiolipin, lecithin and cholesterol). When this type of antigen is used in a given serodiagnostics procedure, one is confronted with the choice of a suitable level of sensitivity. A number of antigen mixtures have been investigated for use in the Kolmer complement fixation test^{8,9} and certain of these have been recommended on the basis of sensitivity, specificity and absence of anticomplementary and nonspecific properties.

In the present study four different cardiolipin antigen mixtures (1, 4, 5 and 10) have been used in parallel with lipoidal antigen in the Kolmer complement fixation test. One of these, no. 1, is a mixture found satisfactory by Harris and Portnoy⁸ and by Kolmer and Lynch.⁹ Another, no. 4, has been used by Maltaner and Maltaner¹⁰ in the New York State Department of Health quantitative complement fixation test and later by Kent, Boyd and Sanders¹¹ in the Kolmer test. Each of these antigens was more sensitive than the Kolmer lipoidal antigen currently in use at this laboratory, and a mixture, no. 5, was prepared which compared in sensitivity with the lipoidal antigen. Another antigen, no. 10, which contained the same concentrations of cardiolipin and lecithin as no. 5, and a higher concentration of cholesterol, was included. The efficiencies of the four antigens representing four different levels of sensitivity have been assessed on the basis of available clinical information.

MATERIALS AND METHODS

The concentrations of the various components in the four cardiolipin antigens are as follows:

	% Cardiolipin	% Lecithin	% Cholesterol
Cardiolipin antigen no. 1	.03	.05	.3
Cardiolipin antigen no. 4	.0175	.0875	.3
Cardiolipin antigen no. 5	.0175	.2	.3
Cardiolipin antigen no. 10	.0175	.2	.68

Antigen emulsions were prepared according to the technique recommended by Kolmer for lipoidal antigen. Cardiolipin antigens nos. 1 and 4 were used at a

antigen no. 5 and the Kolmer lipoidal antigen which is currently in use in the majority of Provincial Laboratories.

Specimens from untreated cases of syphilis

The results in Table II give some indication of the efficiencies of the four cardiolipin antigens and of Kolmer lipoidal antigen in detecting syphilis at various stages of development. In the group of primary cases, cardiolipin antigen no. 1 shows the highest sensitivity (79.4) and antigens 4, 10 and 5 have values of 75.0, 70.4 and 55.8 respectively. With Kolmer lipoidal antigen the sensitivity value is 61.2. It will be noted that with decreasing sensitivity there is an increase in the percentage of doubtful reactions. If one considers the total number of specimens where some degree of reaction appeared, it is found that 79.4% reacted with

TABLE II

CARDIOLIPIN ANTIGENS OF DIFFERENT COMPOSITIONS (C 1, 4, 5 AND 10)
AND KOLMER LIPOIDAL ANTIGEN (K) USED IN THE KOLMER
COMPLEMENT FIXATION TEST

Specimens from Untreated Cases of Syphilis

Antigen	Total Sera	Per cent Positive	Per cent Doubtful	Sensitivity	Total Sera	Per cent Positive	Per cent Doubtful	Sensitivity
Primary Syphilis					Secondary Syphilis			
C 1	34	79.4	0	79.4	19	100	0	100
C 4	34	73.5	3.0	75.0	18	100	0	100
C 10	27	66.7	7.4	70.4	17	100	0	100
C 5	35	48.6	14.3	55.8	18	100	0	100
K	36	55.6	11.1	61.2	21	100	0	100
Latent Syphilis					Neurosyphilis			
C 1	57	89.4	5.3	92.1	33	97.0	0	97.0
C 4	56	92.8	1.8	93.7	33	97.0	0	97.0
C 10	48	95.8	0	95.8	30	96.7	3.3	98.4
C 5	55	90.9	0	90.9	32	84.4	6.2	87.5
K	58	89.6	5.2	92.2	33	90.9	3.0	92.4

antigen no. 1 and 62.9% reacted with antigen no. 5. The difference between the most and least sensitive antigens represents five patients. Positive results were obtained on darkfield examination in four of the five individuals. The fifth patient presented an atypical sore on the penis which was darkfield negative. It is likely that positive reactions would have been observed in a few days with all the antigens in this group of five. The more sensitive antigens, however, would have been of real advantage if the cases had not been suspected of having syphilis and had been examined as a routine measure.

In the group of cases of secondary syphilis (Table II), the sensitivity of each antigen is 100%. The serological titre is usually highest at this stage of the disease and the results are as would be expected.

In the latent group, the sensitivity levels of all antigens lie in the range 95.8 to 90.9. The diagnosis of patients in this group was based on clinical histories and on results obtained with the standard Kahn and Kolmer complement fixation

tests. The sensitivity levels of these tests approximate that of the Kolmer test with cardiolipin antigen no. 5, the least sensitive of the cardiolipin antigens, and it is not surprising that the sensitivity values shown in Table II are high and fairly uniform. It is difficult to explain the relatively high percentage of doubtful reactions observed with antigen no. 1.

A specimen from one patient of the neurosyphilis group gave negative results with cardiolipin antigens 1, 4 and 5 and with the Kolmer antigen (insufficient serum to include antigen no. 10). This individual had been treated ten years previously and the spinal fluid findings were positive on readmission. A specimen from a case of symptomatic neurosyphilis (taboparesis) was positive to cardiolipin antigens 1, 4 and 10 and negative to antigen no. 5 and Kolmer antigen. In another instance a specimen was positive to cardiolipin antigens 1, 4 and 10 and Kolmer antigen and negative to antigen no. 5. The diagnosis of asymptomatic neurosyphilis had been made.

Two cases of late benign syphilis were examined (not included in Table II) and positive results were obtained with the four cardiolipin antigens and Kolmer antigen. Specimens from two cases of cardiovascular syphilis gave positive or doubtful results with all antigens.

TABLE III

CARDIOLIPIN ANTIGENS OF DIFFERENT COMPOSITIONS (C 1, 4, 5 AND 10)
AND KOLMER LIPOIDAL ANTIGEN (K) USED IN THE KOLMER
COMPLEMENT FIXATION TEST

Specimens Obtained Nine to Eighteen Months after Last Treatment Date

Antigen	Number of Specimens				Number of Specimens			
	Positive	Doubtful	Negative	Total	Positive	Doubtful	Negative	Total
	Primary Syphilis				Secondary Syphilis			
C 1	2	2	28	32	3	3	19	25
C 4	1	2	29	32	1	2	22	25
C 10		1	29	30		1	22	23
C 5			32	32	1		24	25
K	1		31	32	1	1	23	25
	Latent Syphilis				Neurosyphilis			
C 1	14	2	7	23	5		3	8
C 4	14	1	8	23	5		3	8
C 10	12	0	8	20	3		4	7
C 5	11	3	9	23	4		4	8
K	10	4	9	23	3	1	4	8

Specimens obtained from treated cases nine to eighteen months after last treatment date.

Included in Table III are patients who had received what appeared to be adequate treatment and from whom specimens were obtained nine to eighteen months after the last treatment date. Each specimen represents a different patient, and if more than one specimen was obtained from the individual during the nine

to eighteen month interval, the results on the last specimen have been used in the table. Considering the treated cases of primary syphilis, it will be noted that negative results were obtained in all instances with cardiolipin antigen no. 5. On the other hand, with the more sensitive cardiolipin antigen no. 1, positive results were obtained on specimens from two patients and two specimens gave doubtful results. In the secondary syphilis group, one positive result is seen with cardiolipin antigen no. 5 and three positive and three doubtful results with cardiolipin antigen no. 1. The same tendency is seen to a lesser degree in the cases of latent syphilis and neurosyphilis.

Specimens from cases of gonorrhoea and from individuals with no evidence of venereal disease.

Turning to the other side of the ledger, it is interesting to note the specificities of the four cardiolipin antigens (Table IV). Specificity is expressed as the percentage of negative results plus one-half the percentage of doubtful results.

TABLE IV

CARDIOLIPIN ANTIGENS OF DIFFERENT COMPOSITIONS (C 1, 4, 5 AND 10)
AND KOLMER LIPOIDAL ANTIGEN (K) USED IN THE KOLMER
COMPLEMENT FIXATION TEST

Specimens from Individuals with No Evidence of Syphilis

Antigen	Specimens from Cases of Gonorrhoea				Specimens from Individuals with No Evidence of Venereal Disease			
	Total Sera	Per cent Positive	Per cent Doubtful	Specificity	Total Sera	Per cent Positive	Per cent Doubtful	Specificity
C 1	703	1.56	2.42	97.2	557	1.44	3.41	96.9
C 4	698	0.86	0.72	98.8	548	1.64	0.73	98.0
C 10	604	0.83	0.16	99.1	476	1.68	0.84	97.9
C 5	684	0.44	1.02	99.0	538	0.56	0.56	99.2
K	724	0.83	0.83	98.8	566	0.71	1.06	98.8

Considering first the specimens from cases of gonorrhoea, the specificity of the test with cardiolipin antigen no. 5 is 99.0 and with antigen no. 10 it is 99.1. The specificities with Kolmer antigen and with antigen no. 4 are the same (98.8). The most sensitive antigen, no. 1, shows the lowest specificity (97.2).

In the group with no evidence of venereal disease, the highest specificity is seen with antigen no. 5 (99.2). Kolmer lipoidal antigen is a close second. The specificities with antigens 4 and 10 are about the same (98.0 and 97.9 respectively). Again the specificity with antigen no. 1 is the lowest of all.

In assessing the specificity of the test with the different antigens, a certain degree of caution is necessary. The diagnosis of latent syphilis must be based on the serological result and the history obtained from the patient. The nonsyphilitic group included in Table IV is made up of individuals who attended the venereal disease clinic and nearly all of them were examined with the suspicion of syphilis in the physician's mind. However, one cannot be absolutely sure that an individual listed in the nonsyphilitic group is not actually a case of latent syphilis with a reagin level detectable only by the more sensitive cardiolipin antigens.

DISCUSSION

In choosing a cardiolipin antigen mixture for use in a given serodiagnostic procedure, it is necessary to adjust the concentrations of the three components so that an optimum level of sensitivity is attained which is consistent with a satisfactory degree of specificity. In the present investigation, a method of attacking the problem is offered. The series is small, but certain trends are evident. It is hoped that the results are of sufficient interest to encourage comparable studies in other Canadian laboratories where larger numbers of patients are available.

Cardiolipin antigens are not used routinely at present in the Provincial Public Health Laboratories. It is quite possible that the purified antigen will be adopted at some future date and the choice of an optimum level of sensitivity may be necessary. During the past ten years, the Provincial Laboratories have participated in a collaborative program¹² to obtain Dominion-wide uniformity of results in the serodiagnosis of syphilis. Antigens and complement are prepared and distributed by the Laboratory of Hygiene and the same standard procedures are used in the majority of the laboratories. One might question if the general level of sensitivity which has been established by the author serologists is optimum. In the past two or three decades the trend has been toward a greater sensitivity of the tests. Undoubtedly cases of syphilis have been brought to light which otherwise would have been missed but the specificity of the tests has probably suffered as a result. Moreover, the problem of false positive reactions becomes more acute in this day and age when blood specimens from large numbers of apparently normal individuals are examined and when the incidence of syphilis is on the decline.

In establishing an optimum level of reactivity, an intensive laboratory and clinical study seems necessary. There are no obvious shortcuts to this somewhat laborious method of attack. We can profit a great deal from the experiences of others, but it should be recognized that geographical, racial and environmental factors may modify the problem in this country. Close teamwork between the medical specialist and the laboratory expert is highly desirable, for in the last analysis the opinion of the syphilologist is of vital importance in the solution of the problem.

SUMMARY

1. Cardiolipin antigens of different levels of sensitivity have been used in parallel with lipoidal antigen in the Kolmer complement fixation test. The results have been analysed on the basis of available clinical information by the use of mark-sense documents.
2. In the diagnosis of new cases, the more sensitive antigens gave a better record. This superiority would have been an advantage in routine serological examinations where syphilis was not suspected.
3. In the serological follow-up of cases, nine to eighteen months after the completion of treatment, there were smaller numbers of positive and doubtful reactions when less sensitive antigens were used.
4. A less satisfactory specificity was seen with the more sensitive cardiolipin antigens.

5. In establishing an optimum level of reactivity, the collaboration of laboratory and clinic is highly desirable.

ACKNOWLEDGMENTS

We wish to express our sincere appreciation to the staff of the Special Treatment Clinic, Ottawa Civic Hospital, and to Dr. A. R. Doane, then director, through whose kindness and cooperation the study was possible.

We are deeply indebted to Dr. Mary Ross and associates at the Dominion Bureau of Statistics for planning the mark-sense documents and for their assistance in the sorting of the documents and the tabulation of results.

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THE TRAINING OF LABORATORY TECHNICIANS

THE RAPID EXTENSION of laboratory facilities in hospitals and departments of health has called for laboratory technicians in numbers quite beyond the facilities which exist for their training. The situation is a serious one. Surveys in Canada and in the United States have revealed most unsatisfactory conditions in regard to laboratory services, particularly in smaller hospitals. These surveys have included samplings for accuracy, and the results can only be interpreted as evidence of the inadequate training of many of the technicians. Today the tendency is to attach an undue measure of importance to laboratory reports and there is an increasing tendency to make the diagnosis in the laboratory rather than at the bedside. The findings of the surveys, revealing as they do the unsatisfactory quality of the work being undertaken, are most disturbing. The present situation in Canada calls for further study and the development of plans for the adequate training of technicians.

In this country the Canadian Society of Laboratory Technologists has rendered valuable service. This organization grew out of the interest of laboratory directors, particularly Dr. W. J. Deadman, pathologist and director of laboratories for the Hamilton General Hospital. Qualifications have been established and examinations conducted; certificates in laboratory technology are now recognized. There is, however, a basic need for training.

Several universities in Canada have made a trial of courses designed to prepare students to serve as laboratory technicians and leading to the degree of Bachelor of Science or Bachelor of Arts. In general, the courses have not been successful, and it has become obvious that the answer to the problem of adequately trained laboratory technicians involves a combination of university training with hospital experience. The University of Saskatchewan provides a course leading to an arts degree in science. Academic instruction occupies three years, and one year of training under a pathologist completes the course. Unfortunately, hardly more than half the graduates have remained in Canada, and the average years of service rendered in this country by the graduates does not exceed two. Two other universities in Canada are considering establishing courses.

A course which is promising and which may constitute a pattern for adoption elsewhere is being developed by Dr. W. A. Riddell, now dean of Regina College, Saskatoon, in association with Mr. Hugh Robertson, director of the Provincial Laboratories. In the years before his appointment at Regina College, Dr. Riddell, in his capacity as director of the Provincial Laboratories, undertook to provide training courses for high-school graduates who wished to become laboratory technicians. The instruction has been given in hospitals and covers a period of eighteen months. Successful candidates are awarded a qualifying certificate by the Canadian Society of Laboratory Technologists. Generally speaking, hospitals have been able to obtain a sufficient number of technicians through this course, but the quality of the instruction has varied greatly and the results are unsatisfactory. At the close of World War II, a short course, occupying three months, was provided by Dr. Riddell in an effort to meet the needs of small hospitals of thirty-five beds; this course combined an elementary bacteriological and chemical training with some instruction in x-ray procedures.

To overcome the disadvantages presented by the four-year course at the University, which occupies too long a period to attract many who otherwise would be interested, and by the eighteen-month course in hospitals, with its varying qualities of instruction, Dr. Riddell is now sponsoring a two-year course at Regina College. One year is spent at the College in obtaining a grounding in the basic sciences, and the second in bench training at the Provincial Laboratories and elsewhere, actually doing laboratory procedures under the direction of full-time instructors. At present a class of approximately thirty students can be accommodated. Dr. Riddell has developed this plan for a two-year course from his years of experience in the training of laboratory technicians and is in a position to provide training for a substantial number of students. This development in Regina College may well afford the answer to the more adequate training of laboratory technicians.

THE LATE DOCTOR ANDREW LESLIE MACNABB

THE GREATLY ENLARGED Ontario Veterinary College at Guelph, with its increased enrolment of students, today stands as a monument to the late Doctor Andrew Leslie MacNabb, its principal for the past seven years and one of the leading veterinarians in North America. From the time of its founding by Dr. Andrew Smith in 1882, the College has been outstanding in veterinary medical education on this continent. Before World War II, however, the registration had declined. At the close of the war, with the increasing appreciation of the importance of veterinary medicine, particularly in the preventive field, steps were taken to encourage a larger enrolment. There was urgent need for the extension of laboratory as well as clinical facilities in the college building. Approximately one million dollars was expended by the Province of Ontario in making the necessary changes. Additional staff members were appointed. The vision and its accomplishment was Dr. MacNabb's.

His training for the principalship was unusual. A graduate of Ontario Veterinary College, he had distinguished himself as director of the Division of Laboratories in the Ontario Department of Health, a position which he held from 1928

to 1945. During his tenure of office, the needs of the Province were met through the development of a comprehensive system of branch laboratories. The volume of work grew enormously over the years, and the importance of the laboratory services was recognized throughout the Province. As a veterinarian, Dr. MacNabb maintained a close contact with the field of veterinary medicine, and he was immediately thought of as the leader who could bring into reality the plans for making the Ontario Veterinary College a greater institution and who could enlist support for the additional staff and facilities which would be required.

In the years that followed, Dr. MacNabb had the satisfaction of seeing the College halls crowded to capacity. The requirement of senior matriculation was introduced and the course in veterinary medicine was extended to five years. In the field of research Dr. MacNabb gave vigorous support, and his plans included the extension of research work by all departments.

In his passing last month, after an illness of more than a year, the College has lost a leader who recognized the need for veterinarians with the highest training and claimed for them an increasing opportunity, not only in the clinical field, but also in medical research.

BOOKS

The Community and Public Health Nursing.

A Handbook for and about Boards and Citizens' Committees. By Edith Wensley, for The National Organization for Public Health Nursing (U.S.A.). New York and Toronto: The Macmillan Company, 1952. 250 pp. \$3.50.

MRS. WENSLEY's book replaces the Board Members' Manual of 1930 and the revised second edition of 1937. It is interestingly written and well organized.

Part I deals with Public Health Nursing—Basic Facts, including the characteristics of early organization, both voluntary and governmental; modern developments in programs; the ratio of public health nurses to population; educational qualifications and provision for nursing supervision, etc.

Part II, Boards and Citizens Committees—Their Responsibilities and Organization, is the longest section and deals with the development of citizen interest and participation through board membership and advisory committee activities. Sub-headings that indicate the practical approach and broad scope of Part II are: Personnel Policies, Setting up the Budget, Ensuring the Wisest Use of Nursing Service, What Committees Are Essential.

Part III deals with Boards and Citizens Committees—How Their Responsibilities are Carried Out. Under this heading the author discusses how to make meetings interesting and productive; board-executive-staff relationships; how to keep informed; volunteer assistants; finances, public relations, and inter-agency relationships.

Each topic is presented with regard for the best possible return in service for the taxpayer's dollar. It is clearly indicated throughout that citizen participation develops confidence and support.

This book is focused on the local community. It offers practical advice on the way in which professional and lay leadership may be developed interdependently to assure continuous growth in the quality and scope of the service.

Health officers as well as public health nurses and board members will find much to interest them in this excellent book.

Edna L. Moore

The Public Health Nurse and Her Patient.

By Ruth Gilbert, R.N. Published for The Commonwealth Fund by Harvard University Press, 1951. Published in Canada by S. J. Reginald Saunders and Company Limited. 348 pp. \$4.70.

"THERE IS A current emphasis—almost an insistence—that all those whose professions are primarily concerned with human relationships, whether or not they are specialists in the problems of human behaviour, must accept responsibility for that part of the mental hygiene that falls more naturally within their function."

In this second edition of *THE PUBLIC HEALTH NURSE AND HER PATIENT*, Miss Gilbert presents to us this challenge. Are we prepared as public health nurses to accept this responsibility?

Eleven years ago the author gave us the first edition. Miss Gilbert is now the coordinator of the course for mental hygiene consultants and assistant professor of nursing education, Teachers College, Columbia University. During the years spent in contact with nurses at the college, she has been collecting material in preparation for this revised and enlarged edition and acknowledges her indebtedness to the nursing profession for the experiences that underlie the book.

Mental Hygiene in Public Health Nursing, the title of the first chapter, might well have been the title of the entire book, for that is the theme carried throughout the six chapters. The author, when writing of the child health conference, states that "A natural opportunity for our front line participation in the mental hygiene movement is not far to seek." The application of mental health principles is made to every phase of the generalized public health nursing program.

Institutional nurses and those with the visiting-nurse organizations will find the

chapter devoted to "Nursing the Sick Patient" of particular interest. The various attitudes of nurses toward illness, disability and bedside care are dealt with at length. Miss Gilbert thinks, for example, that "It is not too much to say that the oversolicitous bedside nurse can retard the convalescence of her patient because of her need to baby him."

Because Miss Gilbert is a psychiatric social worker as well as a nurse, she is well equipped to write the chapter on relationships with co-workers which covers not only the relationships within an agency but between allied professions.

There is an extensive bibliography. In the frontispiece, the author mentions especially Doctor Paul V. Lemkau, whose book *MENTAL HYGIENE IN PUBLIC HEALTH*, is familiar to most public health nurses, and Doctor George Stevenson, Medical Director of the National Association of Mental Health. From the writings of the above authors, Miss Gilbert quotes freely.

This book is clearly and simply written. It is exceptionally well indexed and consequently will be valuable as a reference book. An outstanding feature is its richness of illustrations. The words "for instance" are used time after time to clarify a point. I would recommend it for use in the libraries of schools of nursing and public health agencies.

Isobel Black

Children from Seed to Saplings.

By Martha May Reynolds. New York: McGraw-Hill Co., 1951. Toronto: McGraw Hill Co. of Canada, Ltd., 50 York Street. 2nd ed. pp. \$4.35.

"THE BEST WAY to find out about children is to study real live children, but you must know what to look for and how to interpret what you see."

In *CHILDREN FROM SEED TO SAPLINGS*, public health nurses and other health workers will find not only sound principles and philosophy of child study but many useful suggestions as to the methods of observing the child from birth to teen age and of recording these observations.

In the Preview, the author explains that "child study, the scientific study of children, is broader than child psychology, child hygiene or education—it includes all these

fields and many more"; that it should build up between the child and adult a sympathetic understanding, and that the satisfaction which comes of this relationship will contribute to the growth of both personalities.

The first edition of this book was published over ten years ago when the author was a psychologist and teacher in a college.

This new edition has been written "not because children have changed" but because so much more is known about them; it has been enriched by her own experience as a mother of four children, now adolescents. "They were teachers as well as guinea pigs. Their contribution was both important and lively." Actual histories of normal children have been used with carefully tested theories and procedures developed in the Child Development Department at Vassar College, New York, and elsewhere.

Intended primarily as a guide "for the study of children wherever they are found" by university students specializing in this field, this book should be of equal interest and value to public health nurses and those whose unique opportunity it is to work with parents, children and teachers in normal situations. Suggestions are offered as to what to look for in the child or group of children. The significance, however, is not always explained nor is the reader always told what to do. The author expects that each person studying a child will work this out in relation to the individual child or situation studied and in discussion with teacher and parents.

Chapters deal with each year of the child's life and all phases of his development until he reaches the age of seventeen. In addition, explicit instructions are given for the observation of children and the situations in which they are likely to be found at different ages. There are four appendices.

That so broad a subject as the development and observation of children from birth to seventeen is difficult to cover in one book is a criticism apparently anticipated by the author and answered on page 4 where she explains that it is an effort to give what most books do not give, a well-balanced picture of the whole span of child growth and, in particular, those age groups from five to twelve years "which students skip over lightly because references are

scarce at these levels". The reader is directed to references for more extensive study of any age group.

An annotated list of visual materials and an index conclude a most useful and interesting book which should achieve the aim set by the author "to help grown-ups catch the spirit and taste the joy of working with children so that they will be led on to study human behaviour further and to work out a philosophy that will be helpful to them in all their relationships".

Alice G. Nicolle

Nutrition and Climatic Stress, with Particular Reference to Man.

By H. H. Mitchell and Marjorie Edman. Springfield, Ill.: Charles C Thomas, 1951. In Canada, The Ryerson Press, Toronto. 234 pages. \$8.00.

ANYONE WHO is familiar with the work which the senior author of this book has done in the field of nutrition would expect this volume to have been prepared carefully and critically. This expectation is fulfilled. The book is a compilation of existing literature with valuable critical comments. There are four main topics: Diet in a Cold Environment, Diet in a Hot Environment, Diet at Altitude, Practical Considerations.

This book will be of great interest to research personnel in the armed forces and to persons concerned with scientific work in the field of nutrition. It cannot be recommended to public health personnel. However, some of the conclusions are worth noting. Tolerance to cold is improved by the ingestion of a high-carbohydrate or a high-fat diet; dietary protein increases are not beneficial. Physicians in the field of industrial hygiene may be surprised to learn that the use of salt tablets by men exposed to high temperatures is unnecessary, except perhaps during an initial period of acclimatization (p. 93).

Two sentences on page 143 do need to be brought to the attention of public health personnel and, indeed, to the attention of many physicians. The sentences are, "The hope is so frequently entertained by nutritionists, even though it almost always ends in disappointment, that vitamins consumed above demonstrated requirements will exert some miraculous effect on body functioning in contrast to the more prosaic nutrients,

the proteins, carbohydrates, fats and minerals. The hope seems to be based upon the presumption that if a vitamin promotes a given function in the body, more of it should do even a better job." The fallacy of these sentences is exploded beautifully in the special fields discussed in this volume; the fallacy needs to be pointed out generally and frequently.

E. W. McHenry

Microbiology General and Applied.

By William Bowen Sarles, William Carroll Frazier, Joe Bransford Wilson, and Stanley Glenn Knight. New York: Harper & Brothers, 1951. 493 pp. \$4.50.

THIS INTRODUCTION to microbiology has been compiled by four authors, members of the Department of Agricultural Bacteriology, University of Wisconsin. All are eminently qualified both in research and in teaching. Although this is the first printed edition, it has been preceded by five mimeographed editions, and it is evident from the quality of the presentation that the authors acquired a good deal of knowledge and experience in their preparation.

The aim of the authors was to present in general, and not in detail, the broad subject of microbiology to beginners. This aim has been admirably achieved. In addition, there are references following each chapter for anyone wishing to pursue any particular subject in greater detail.

The sections dealing with applied bacteriology are well presented and should serve not only to stimulate the student's interest in the practical side but also to supplement his knowledge of the broad application of microbiology to many fields of general interest.

The authors have wisely put the history and development of microbiology at the end of the book where the student is more likely to read it after he has become more familiar with the subject. The same is true of the classification of bacteria, yeasts and fungi, which are placed in appendices rather than in the body of the text.

Although the book is only 493 pages in length it covers a broad field with remarkable clarity. The illustrations are excellent. This volume should benefit teacher and student alike and it is hoped that this first edition will be followed by many more.

R. J. Wilson

EMPLOYMENT SERVICE

Advertisements regarding "positions available" and "personnel available" will be published in from one to three consecutive issues, depending upon the requirements of the agency or person concerned. They are limited to seventy words or less, with a confidential box number if desired. There is no charge for this service to members of the Association. Health agencies are charged a flat rate of \$10.00 for the advertisements (up to four consecutive issues) and for the service. The rate for non-members is \$5.00. The service includes confidential clearing of information between prospective employer and employee if desired.

Medical Officer of Health: Applications are invited from graduates in medicine who have postgraduate training in public health for the position of Medical Officer of Health of the City of Kingston. Salary will be according to experience and qualifications. Part-time teaching at Queen's University is possible for a suitably qualified applicant. T. J. McKibbin, Secretary, Board of Health, Kingston, Ontario. 1/

Her Majesty's Colonial Research Service: Applications are invited from medical practitioners with qualifications registerable in the United Kingdom for two posts of MEDICAL RESEARCH OFFICER in the VIRUS RESEARCH INSTITUTE, LAGOS, NIGERIA. Experience in virus techniques and/or medical research an advantage. Institute has well-equipped laboratory, and good accommodation is available for married or single officers. Salary according to age and experience. Further information obtainable from Dr. R. S. K. Seeley, Liaison Officer for Canada, United Kingdom Colonial Service, Trinity College, Toronto 5, Canada.

Public Health Nurse required for generalized program in semi-urban community. Salary \$2200-\$2700, adjusted according to experience, with annual increment. Transportation allowance. Usual employee benefits. Apply to: Dr. W. K. Fenton, Medical Officer of Health, Township of Etobicoke, 4946 Dundas Street West, Islington, Toronto 18.

Wanted immediately: Physician to serve as Medical Officer of Health and Director of the Kent County Health Unit, to fill the vacancy created by the recent death of Dr. F. H. Wilson. State qualifications and experience. Applicants should have the qualifications laid down by the Department of Health of Ontario. W. M. Abraham, Secretary-Treasurer, Kent County Board of Health, Kent County Municipal Building, Seventh Street, Chatham, Ontario. 2/

Public Health Nurses for generalized program with City Health Department. Salary \$2,400 to \$3,000. Annual increment \$100. Sick leave plan. Four weeks' vacation. Pension plan and Blue Cross available. Transportation provided. Applications to Dr. A. F. Mackay, Medical Officer of Health, 65 Simcoe Street South, Oshawa, Ontario.

Public Health Nurses, City of Kingston: Due to recent annexation of additional area to the City, public health nurses are required for generalized program with the City of Kingston. Minimum salary \$2,200, with allowance for experience, annual increment of \$100, cumulative sick leave. Pension plan and Blue Cross Hospital Plan are available if desired. Cars supplied for transportation while on duty. Apply to: Mr. T. J. McKibbin, Secretary of the Board of Health, City Hall, Kingston, Ontario. 3/

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